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717 HIV-Related Beliefs, Knowledge, and Behaviors among High School Students
721 Update: Influenza — United States, 1988–89 Season
727 Periconceptional Use of Multivitamins and the Occurrence of Anencephaly and Spina Bifida

Current Trends

HIV-Related Beliefs, Knowledge, and Behaviors among High School Students

In 1987, CDC began to assist state and local departments of education in assessing human immunodeficiency virus (HIV)-related beliefs, knowledge, and behaviors among high school students in states and cities with the highest cumulative incidence of acquired immunodeficiency syndrome (AIDS) (*1,2*). Departments of education will use the results of these surveys to plan school HIV education programs and to monitor temporal changes in HIV-related beliefs, knowledge, and behaviors among high school students. This report presents selected baseline data from surveys conducted during the spring of 1988.

A questionnaire for anonymous self-administration was developed collaboratively by representatives of 24 state and local departments of education, with technical assistance from CDC. The questionnaire contained 49 core questions: four to assess demographic characteristics of respondents, 33 to assess HIV-related beliefs and knowledge, and 12 to assess behaviors associated with HIV transmission. Each department of education that conducted the survey first completed the appropriate state or local survey review and approval process.

The survey included samples of students in grades 9–12 (ages 13–18 years) in each of six cities (Chicago, Los Angeles, New Orleans, New York City, San Francisco, and Seattle) and in each of nine states (California, District of Columbia*, Kentucky, Michigan, New Jersey, New York, Ohio, Pennsylvania, and Washington). Samples from California, New York, and Washington excluded students in Los Angeles, San Francisco, New York City, and Seattle; data from these four cities were collected and analyzed separately. Each site chose which of the 49 questions to administer; nearly

*District of Columbia is categorized as a state for funding purposes.

HIV — Continued

every site obtained information using all the questions regarding demographic characteristics and HIV-related beliefs and knowledge. Four sites (California, District of Columbia, Michigan, and San Francisco) used the 12 questions to assess the extent to which students engage in behaviors that may result in HIV infection.

Sampling strategies were designed to obtain a representative sample of students and varied among sites. Most sites used a geographically stratified cluster sample, randomly selecting schools within strata, then selecting classes within each selected school. Other sites used a random sample of schools, then randomly selected students at each school. Using standardized procedures, classroom teachers or department heads administered questionnaires in required classes, e.g., health education or homeroom.

Sample sizes in each site ranged from 778 to 7013 students, and the response rate of schools from each site ranged from 52% to 100% (Table 1). Because response rates of schools from some sites were less than 100%, results cannot be generalized, and comparison of the results among sites should be made with caution. Results are presented by site as unweighted crude rates.

Almost all respondents believed students their age should be taught about AIDS[†] in school (range, 89.0% to 96.8%). Knowledge about sources for correct information about AIDS varied greatly among sites (range, 41.1% to 70.5%).

The range of students who knew that AIDS is not transmitted through shaking hands was 85.5% to 95.6%; through giving blood, 27.8% to 53.3%; from mosquito or other insect bites, 28.9% to 46.8%; from using public toilets, 41.8% to 64.6%; and from having a blood test, 49.6% to 75.4% (Table 2). A range of 83.8% to 98.4% of students knew that AIDS is transmitted by sharing needles or syringes used to inject drugs; 88.3% to 98.1% knew that AIDS is transmitted through sexual intercourse.

High school students from four sites reported variable rates of intravenous (IV)-drug use and sexual intercourse (Table 3): 2.8% to 6.3% reported ever injecting cocaine, heroin, or other illegal drugs; 28.6% to 76.4% reported having had sexual intercourse at least once. At each site, more male than female students and more older than younger students reported ever injecting illegal drugs or ever having had sexual intercourse.

The percentage of students who reported having had three or more sex partners ranged from 15.1% to 42.6%. At each site, more male than female students (range for males, 24.2% to 67.3%; for females, 8.3% to 25.6%) and more older than younger students reported three or more sex partners (range for 13- and 14-year-olds, 7.5% to 45.5%; for 15- and 16-year-olds, 13.0% to 39.4%; and for 17- and 18-year-olds, 29.9% to 47.7%).

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[†]When the questionnaire was developed in 1987, representatives of state and local departments of education believed students would not understand the term "HIV infection"; thus, the term "AIDS" was used.

TABLE 1. Demographic characteristics and response rates of sch

Site*	Sample size	School-level response rate† (%)	Gender (%)		Age
			Female	Male	13–14
State					
California	7013	64	51	49	10
District of Columbia	1275	100	55	45	2
Kentucky	778	73	55	45	26
Michigan	991	100	51	49	7
New Jersey	2287	100	53	47	16
New York	3841	100	49	51	10
Ohio	803	57	53	47	8
Pennsylvania	6668	97	52	48	32
Washington	1137	52	48	52	45
City					
Chicago	1254	100	48	52	19
Los Angeles	2142	100	49	51	1
New Orleans	2366	100	54	46	37
New York City	2813	100	58	42	10
San Francisco	802	88	52	48	10
Seattle	1069	100	47	53	22

*District of Columbia is categorized as a state for funding purposes.
†Number of schools conducting survey/number of schools sampled.
‡Data not available.

HIV – Continued

f schools in selected cities and states, 1988

Age group (yrs) (%)			Race/ethnicity (%)				
–14	15–16	17–18	White	Black	Hispanic	Asian	Other
10	49	42	59	7	20	9	5
2	70	28	3	90	3	3	2
26	71	3	91	8	0	1	1
7	49	43	75	19	3	1	2
16	30	55	56	27	13	2	1
10	50	39	NA[§]	NA	NA	NA	NA
8	55	37	88	9	1	1	1
32	43	25	68	21	6	2	2
45	52	3	NA	NA	NA	NA	NA
19	53	29	11	64	19	4	2
1	83	17	21	24	33	15	7
37	46	16	9	84	2	4	1
10	50	40	NA	NA	NA	NA	NA
10	75	14	12	13	14	56	6
22	37	41	52	18	3	22	6

HIV — Continued

TABLE 2. Percentage of correct responses for questions measuring knowledge of HIV transmission, by selected cities and states, 1988

Site*	Nonrisk factor					Risk factor	
	Shaking hands	Giving blood	Insect bites	Using public toilets	Having a blood test	IV-drug use	Sexual intercourse
State							
California	92.4	44.5	36.4	56.2	62.3	94.8	95.7
District of Columbia	89.3	36.4	37.1	55.7	58.5	91.7	91.5
Kentucky	91.6	48.8	37.6	50.8	64.4	95.6	94.3
Michigan	93.5	49.1	37.3	54.4	66.6	96.4	96.2
New Jersey	93.7	45.3	40.7	59.5	61.6	95.9	96.5
New York	95.6	39.5	41.7	61.7	56.2	98.4	98.1
Ohio	92.0	53.3	39.1	59.4	64.6	96.6	95.7
Pennsylvania	93.0	49.0	46.8	64.6	63.9	NA†	NA
Washington	94.3	NA	40.1	59.7	75.4	97.7	96.5
City							
Chicago	89.3	28.0	30.4	54.1	58.1	89.1	88.3
Los Angeles	86.9	27.8	28.9	45.8	49.6	91.2	93.8
New Orleans	85.5	29.0	33.5	41.8	49.8	83.8	88.3
New York City	94.8	29.8	41.9	60.1	56.0	98.4	96.9
San Francisco	90.2	40.3	38.4	58.5	57.4	88.6	89.8
Seattle	91.7	41.9	42.8	60.0	59.9	96.4	95.9

*District of Columbia is categorized as a state for funding purposes.
†Data not available.

TABLE 3. Percentage of students reporting ever using IV drugs and ever having had sexual intercourse, by sex, age group, and selected cities and states, 1988

Site	Total (%)	Gender (%)		Age group (yrs) (%)		
		Female	Male	13–14	15–16	17–18
	IV-drug use					
California	4.1	2.6	5.7	2.8	3.9	4.3
District of Columbia	6.3	4.6	8.7	*	4.0	8.9
Michigan	2.8	2.1	3.4	3.2	3.2	1.3
San Francisco	3.7	2.4	5.1	1.4	3.9	2.4
	Sexual intercourse					
California	55.6	48.1	64.3	23.2	50.1	69.0
District of Columbia	76.4	65.6	90.7	*	71.4	89.8
Michigan	58.7	56.6	60.9	34.5	49.1	72.7
San Francisco	28.6	22.1	37.3	15.9	26.7	48.0

*Less than 5% of subgroup in sample.

HIV – Continued

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Editorial Note: In the fall of 1987, CDC began providing fiscal and technical assistance to 15 state and 12 local departments of education that serve areas with the highest cumulative incidence of AIDS. The purpose of this assistance was to help schools implement effective HIV education programs. In the fall of 1988, this assistance was extended to departments of education in the remaining states and territories and in four other local departments of education. Some state and local departments of education are initiating a unique school-based system to assess whether important HIV-related beliefs, knowledge, and behaviors of high school students in their respective states and cities change over time. In ensuing years, department of education staff plan to improve the representativeness and response rate of samples and to begin assessing changes in other important health behaviors (e.g., drinking and driving, cigarette smoking, exercise) among high school students.

Baseline data reported here suggest that HIV-related beliefs, knowledge, and behaviors among the adolescents surveyed in 15 states and cities are generally similar. Many students incorrectly thought that HIV infection may be acquired from giving blood, using public toilets, or having a blood test or from mosquito and other insect bites. Most students knew sexual intercourse and IV-drug use can result in HIV infection. Students who reported using IV drugs or having sexual intercourse, particularly with multiple partners, are at risk for HIV infection. Departments of education should implement programs to correct misperceptions about HIV transmission, to reduce behaviors resulting in HIV infection, and to assess periodically whether these misperceptions and behaviors change among high school students over time (*3*).

References

1. Kolbe L, Jones J, Nelson G, et al. School health education to prevent the spread of AIDS: overview of a national program. Hygie 1988;7(3):10–3.
2. Kann L, Nelson GD, Jones JT, Kolbe L. Establishing a system of complementary school-based surveys to periodically assess AIDS-related knowledge, beliefs, and behaviors among adolescents. J Sch Health 1989 (in press).
3. CDC. Guidelines for effective school health education to prevent the spread of AIDS. MMWR 1988;37(suppl S-2).

Epidemiologic Notes and Reports

Update: Influenza – United States, 1988–89 Season

National surveillance for the 1988–89 influenza season (*1*) began in October. As of November 26, one outbreak in Ohio and culture-confirmed, sporadically occurring cases in Arizona, Hawaii, Maryland, Michigan, and Texas have been reported to CDC.

On November 22, the first outbreak of the season was reported from Ohio. At the beginning of the school year, the Ohio Department of Health provides each school district with guidelines on recognizing possible outbreaks of influenza and other

Influenza — Continued

diseases and requests that such outbreaks be reported promptly to the local or state health department. On November 14, an outbreak of influenza-like illness was reported to the state health department from one elementary and one middle school in the same school district. On November 16, throat swabs were obtained from eight ill children and a 25-year-old teacher in the elementary school. Influenza type B was recovered from the specimens obtained from the teacher and four of the children. All persons have recovered without complications.

Six cases of influenza type B virus have also been reported in children in Texas. The first case occurred in Houston in a 5-year-old boy who had onset of an upper respiratory infection (URI) with fever of 100 F (37.8 C) on October 11. A throat swab was taken 2 days later, and influenza type B virus was isolated on October 17. Although the patient's 11-year-old brother had symptoms of influenza-like illness on October 19, a specimen obtained from him on October 21 did not yield influenza virus.

(Continued on page 727)

TABLE I. Summary — cases of specified notifiable diseases, United States

Disease	47th Week Ending			Cumulative, 47th Week Ending		
	Nov. 26, 1988	Nov. 28, 1987	Median 1983-1987	Nov. 26, 1988	Nov. 28, 1987	Median 1983-1987
Acquired Immunodeficiency Syndrome (AIDS)	358	U*	189	27,540	18,192	7,152
Aseptic meningitis	141	163	163	6,115	10,385	9,919
Encephalitis: Primary (arthropod-borne & unspec)	9	33	27	698	1,202	1,202
Post-infectious	-	-	1	110	92	98
Gonorrhea: Civilian	10,329	12,261	16,898	624,853	695,703	804,825
Military	203	146	383	10,523	14,828	19,130
Hepatitis: Type A	475	503	407	23,366	22,227	20,581
Type B	398	484	484	20,241	22,943	23,325
Non A, Non B	39	41	66	2,258	2,664	3,202
Unspecified	69	47	99	2,102	2,801	4,643
Legionellosis	8	9	14	872	870	693
Leprosy	4	4	4	154	180	217
Malaria	12	9	17	906	818	911
Measles: Total†	77	15	32	2,716	3,538	2,670
Indigenous	23	14	16	2,397	3,119	2,238
Imported	54	1	1	319	419	303
Meningococcal infections	21	45	45	2,516	2,632	2,406
Mumps	90	114	59	4,141	11,635	2,987
Pertussis	88	41	33	2,585	2,285	2,285
Rubella (German measles)	-	3	12	187	324	597
Syphilis (Primary & Secondary): Civilian	620	726	556	36,311	32,049	25,198
Military	2	3	3	144	147	147
Toxic Shock syndrome	6	3	6	313	303	338
Tuberculosis	280	453	453	19,003	19,306	19,306
Tularemia	-	2	2	170	185	185
Typhoid Fever	10	13	6	356	314	341
Typhus fever, tick-borne (RMSF)	3	1	3	596	582	729
Rabies, animal	29	87	83	3,867	4,281	4,919

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1988		Cum. 1988
Anthrax	-	Leptospirosis	41
Botulism: Foodborne	26	Plague	14
Infant (Ps. 1)	33	Poliomyelitis, Paralytic	1
Other	3	Psittacosis (Mich. 1, Colo. 1)	80
Brucellosis (Tex. 4)	62	Rabies, human	-
Cholera (Nev. 1)	7	Tetanus	48
Congenital rubella syndrome	4	Trichinosis	40
Congenital syphilis, ages < 1 year	426		
Diphtheria	-		

*Because AIDS cases are not received weekly from all reporting areas, comparison of weekly figures may be misleading.
†Three of the 77 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending November 26, 1988 and November 28, 1987 (47th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1987	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988
UNITED STATES	27,540	6,115	698	110	624,853	695,703	23,366	20,241	2,258	2,102	872	154
NEW ENGLAND	1,179	386	24	4	19,620	21,570	770	1,049	111	86	48	15
Maine	26	19	2	-	358	622	18	50	5	1	4	-
N.H.	35	40	1	3	241	361	42	66	10	4	4	-
Vt.	10	29	7	-	107	201	14	39	6	4	5	-
Mass.	650	157	8	1	8,576	7,567	395	657	71	62	33	14
R.I.	81	87	-	-	1,852	1,971	82	76	11	-	3	1
Conn.	377	53	6	-	10,486	10,848	249	161	8	15	-	-
MID. ATLANTIC	9,179	663	53	4	97,443	109,519	1,780	2,943	177	290	205	8
Upstate N.Y.	1,185	361	34	1	14,458	15,900	690	701	69	19	77	-
N.Y. City	5,070	129	8	3	39,700	58,378	329	1,234	18	212	45	7
N.J.	2,152	61	11	-	14,267	14,848	410	670	60	42	40	1
Pa.	772	112	-	-	29,018	20,393	351	338	30	17	43	-
E.N. CENTRAL	1,969	1,020	182	13	106,065	106,365	1,544	2,137	195	118	205	6
Ohio	442	404	62	3	23,969	24,246	309	508	33	19	80	-
Ind.	80	95	28	-	8,119	8,359	152	311	19	27	28	-
Ill.	925	92	32	10	32,090	30,486	506	450	68	31	-	5
Mich.	417	382	43	-	33,722	34,020	368	624	51	38	57	-
Wis.	105	47	17	-	8,165	9,244	209	244	24	3	40	1
W.N. CENTRAL	669	249	52	11	26,849	28,102	1,252	906	98	32	72	1
Minn.	146	30	11	3	3,556	4,187	90	123	21	3	4	-
Iowa	39	38	9	3	2,034	2,715	43	77	13	2	18	-
Mo.	350	101	1	-	15,446	14,966	758	540	44	17	21	-
N. Dak.	4	5	4	-	165	262	6	14	3	5	1	-
S. Dak.	7	18	5	2	448	566	26	4	3	-	14	-
Nebr.	34	11	12	2	1,410	1,857	46	40	2	-	5	-
Kans.	89	46	10	1	3,790	3,571	283	108	12	5	9	1
S. ATLANTIC	4,908	1,320	103	40	176,986	182,235	2,161	4,240	351	326	134	1
Del.	62	43	3	-	2,785	3,115	44	128	7	4	13	-
Md.	497	190	10	3	18,371	20,880	288	649	38	25	19	1
D.C.	434	20	1	1	13,412	12,174	16	42	4	1	1	-
Va.	328	195	32	4	12,905	13,332	341	303	72	224	11	-
W. Va.	16	38	22	-	1,223	1,286	14	65	5	4	-	-
N.C.	264	182	21	-	25,173	26,986	301	769	85	-	31	-
S.C.	166	21	-	1	14,039	14,192	40	485	12	5	26	-
Ga.	699	144	1	2	33,411	32,456	564	624	14	6	21	-
Fla.	2,472	509	13	29	55,667	57,814	573	1,175	114	57	12	-
E.S. CENTRAL	707	413	60	8	49,839	52,393	706	1,307	189	13	48	2
Ky.	88	143	20	1	5,039	5,292	464	261	59	2	20	-
Tenn.	324	48	15	-	17,375	18,485	154	596	40	-	8	-
Ala.	190	166	25	2	14,969	16,442	55	336	59	10	14	2
Miss.	105	56	-	5	12,436	12,194	33	114	11	1	6	-
W.S. CENTRAL	2,348	731	84	3	66,663	78,577	2,901	1,885	196	504	28	33
Ark.	76	15	5	-	6,603	8,887	314	99	5	17	4	-
La.	340	117	24	1	13,449	13,119	150	331	25	16	7	1
Okla.	127	68	8	-	6,402	8,479	459	163	42	28	15	-
Tex.	1,805	531	47	2	40,209	48,092	1,978	1,272	124	443	-	32
MOUNTAIN	810	217	27	3	13,453	18,132	3,101	1,477	233	158	44	1
Mont.	11	4	-	-	376	505	39	53	10	4	2	-
Idaho	10	1	-	-	305	631	125	101	9	4	-	-
Wyo.	6	2	-	-	183	390	5	12	3	-	3	-
Colo.	300	69	3	-	2,989	4,089	215	182	64	69	8	1
N. Mex.	49	23	3	1	1,338	1,987	503	217	18	1	4	-
Ariz.	261	76	12	1	4,883	6,160	1,717	581	71	53	19	-
Utah	58	25	4	1	495	565	284	128	37	18	3	-
Nev.	115	17	5	-	2,904	3,805	213	203	21	9	5	-
PACIFIC	5,771	1,117	113	24	67,935	98,820	9,151	4,317	728	575	89	87
Wash.	342	-	7	4	6,386	8,140	2,073	781	179	70	21	7
Oreg.	163	-	-	-	2,952	3,837	1,249	532	84	21	4	1
Calif.	5,150	999	101	20	57,114	84,771	5,291	2,905	452	466	61	67
Alaska	19	25	3	-	963	1,517	526	49	8	11	-	1
Hawaii	97	103	2	-	540	755	12	50	5	5	3	11
Guam	1	-	-	-	122	179	9	13	-	2	1	5
P.R.	1,230	69	4	1	1,145	1,763	51	240	41	40	-	3
V.I.	32	-	-	-	404	260	1	7	2	-	-	-
Amer. Samoa	-	-	-	-	65	80	3	2	-	5	-	2
C.N.M.I.	-	-	-	-	39	-	1	3	-	4	-	1

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending November 26, 1988 and November 28, 1987 (47th Week)

Reporting Area	Malaria	Measles (Rubeola)					Meningococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1988	1988	Cum. 1988	1988	Cum. 1988	Cum. 1987	Cum. 1988	1988	Cum. 1988	1988	Cum. 1988	Cum. 1987	1988	Cum. 1988	Cum. 1987
UNITED STATES	906	23	2,387	54	319	3,538	2,516	60	4,141	86	2,585	2,286	-	187	324
NEW ENGLAND	68	-	83	-	54	281	218	-	117	1	178	157	-	9	1
Maine	3	-	7	-	-	3	10	-	-	-	24	28	-	-	1
N.H.	3	-	67	-	44	162	23	-	105	-	47	39	-	6	-
Vt.	4	-	-	-	-	26	16	-	6	1	6	4	-	-	-
Mass.	33	-	2	-	2	66	96	-	7	-	60	54	-	3	-
R.I.	6	-	-	-	-	2	21	-	-	-	17	3	-	1	-
Conn.	19	-	7	-	8	22	53	-	-	-	23	29	-	-	-
MID. ATLANTIC	181	10	803	-	49	582	265	7	347	34	228	273	-	14	12
Upstate N.Y.	38	-	19	-	18	40	126	-	96	26	138	156	-	2	10
N.Y. City	89	-	48	-	6	463	64	-	101	2	8	13	-	7	1
N.J.	11	10	309	-	11	39	63	-	53	-	15	17	-	3	1
Pa.	23	-	529	-	14	40	12	7	97	6	67	87	-	2	-
E.N. CENTRAL	48	-	141	51	108	383	349	6	812	1	238	255	-	31	40
Ohio	11	-	2	515	83	5	127	-	113	-	49	74	-	1	-
Ind.	4	-	57	-	-	-	26	-	73	-	74	17	-	-	-
Ill.	3	-	56	-	16	203	74	-	296	-	44	17	-	26	29
Mich.	23	-	26	-	5	29	82	6	215	1	35	47	-	4	9
Wis.	7	-	-	-	4	146	40	-	116	-	36	100	-	-	2
W.N. CENTRAL	18	-	11	-	3	230	91	-	191	3	127	135	-	2	2
Minn.	6	-	10	-	1	39	19	-	-	-	49	13	-	-	-
Iowa	2	-	-	-	1	-	-	-	34	3	33	57	-	-	1
Mo.	6	-	1	-	1	189	34	-	40	-	22	33	-	-	-
N. Dak.	-	-	-	-	-	1	1	-	-	-	11	13	-	-	-
S. Dak.	-	-	-	-	-	-	4	-	1	-	6	3	-	-	-
Nebr.	1	-	-	-	-	-	12	-	11	-	-	1	-	-	-
Kans.	3	-	-	-	-	1	21	-	105	-	7	15	-	2	1
S. ATLANTIC	119	11	386	-	22	167	434	9	674	-	239	305	-	18	19
Del.	1	-	-	-	-	32	2	-	1	-	7	5	-	-	2
Md.	20	-	11	-	6	7	52	-	129	-	46	19	-	1	3
D.C.	12	-	-	-	-	1	8	5	269	-	1	-	-	-	1
Va.	20	11	218	-	2	1	51	-	136	-	23	52	-	11	1
W. Va.	3	-	6	-	-	-	7	-	17	-	8	39	-	-	-
N.C.	16	-	-	-	6	6	67	-	51	-	65	119	-	1	1
S.C.	10	-	-	-	-	2	36	-	6	-	1	-	-	-	-
Ga.	6	-	-	-	-	10	68	2	31	-	36	23	-	2	2
Fla.	31	-	160	-	10	108	143	2	34	-	52	48	-	3	9
E.S. CENTRAL	19	-	70	-	-	8	238	3	442	-	100	48	-	2	3
Ky.	-	-	35	-	-	-	54	-	210	-	12	2	-	-	2
Tenn.	-	-	1	-	-	-	130	3	214	-	29	15	-	2	1
Ala.	10	-	-	-	-	4	39	-	15	-	55	24	-	-	-
Miss.	9	-	34	-	-	4	15	N	N	-	4	7	-	-	-
W.S. CENTRAL	78	-	14	-	3	448	171	24	813	-	203	276	-	11	11
Ark.	4	-	-	-	1	-	20	9	125	-	25	13	-	4	2
La.	12	-	-	-	-	-	48	9	257	-	18	50	-	-	-
Okla.	10	-	8	-	-	4	19	-	197	-	62	162	-	1	5
Tex.	52	-	6	-	2	444	84	6	194	-	98	51	-	6	4
MOUNTAIN	42	1	118	3	33	496	75	2	204	39	779	203	-	6	25
Mont.	5	1	6	31	31	128	2	-	2	-	2	6	-	-	8
Idaho	2	-	-	-	1	-	6	1	5	5	328	71	-	-	1
Wyo.	-	-	-	-	-	2	-	1	4	-	2	5	-	-	1
Colo.	14	-	112	-	1	9	19	-	32	-	29	66	-	2	-
N. Mex.	2	-	-	-	-	317	11	N	N	1	52	12	-	-	-
Ariz.	13	-	-	-	-	36	18	-	137	32	338	33	-	-	5
Utah	4	-	-	-	-	1	15	-	7	1	27	10	-	3	10
Nev.	2	-	-	-	-	3	2	-	17	-	1	-	-	1	-
PACIFIC	353	1	682	-	47	943	675	10	541	8	495	633	-	84	211
Wash.	22	-	7	-	-	44	62	5	57	1	111	95	-	-	2
Oreg.	16	-	6	-	2	100	41	N	N	2	48	71	-	-	2
Calif.	301	1	645	-	37	794	549	3	442	5	271	226	-	66	135
Alaska	3	-	1	-	-	1	6	-	13	-	7	6	-	-	2
Hawaii	11	-	3	-	8	4	17	2	18	-	58	236	-	28	70
Guam	-	-	-	-	1	2	-	-	2	-	-	-	-	1	1
P.R.	2	-	226	-	-	771	11	-	10	-	15	20	-	3	3
V.I.	-	-	-	-	-	-	-	-	33	-	-	-	-	-	1
Amer. Samoa	-	-	-	-	-	1	2	-	3	-	-	-	-	-	-
C.N.M.I.	1	-	-	-	-	-	1	-	2	-	-	-	-	-	-

*For measles only, imported cases includes both out-of-state and international importations.
N: Not notifiable U: Unavailable †International §Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending November 26, 1988 and November 28, 1987 (47th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1988	Cum. 1987	Cum. 1988	Cum. 1988	Cum. 1987	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988
UNITED STATES	36,311	32,049	313	19,003	19,306	170	356	596	3,867
NEW ENGLAND	1,078	578	24	501	577	4	35	12	15
Maine	12	1	4	20	22	-	-	-	1
N.H.	6	3	5	11	18	-	-	-	6
Vt.	3	4	2	4	14	-	1	-	-
Mass.	397	273	10	298	317	3	21	7	-
R.I.	30	11	-	39	88	-	6	2	-
Conn.	631	284	3	129	148	1	7	3	9
MID. ATLANTIC	8,713	5,923	46	3,892	3,535	-	69	19	449
Upstate N.Y.	642	225	22	499	467	-	15	11	43
N.Y. City	6,068	4,392	6	2,175	1,734	-	41	6	-
N.J.	903	650	3	604	623	-	11	-	14
Pa.	1,210	656	15	614	711	-	2	2	392
E.N. CENTRAL	1,051	799	45	2,128	2,137	1	33	36	139
Ohio	96	101	31	403	382	-	6	24	5
Ind.	49	54	1	220	219	-	2	2	29
Ill.	483	403	1	929	962	-	17	7	29
Mich.	390	187	12	480	487	1	4	2	34
Wis.	31	54	-	96	87	-	2	1	42
W.N. CENTRAL	220	166	43	471	559	77	4	91	419
Minn.	17	18	5	77	110	3	2	2	124
Iowa	23	26	7	52	38	-	-	-	13
Mo.	145	78	12	231	302	47	2	55	20
N. Dak.	1	1	3	15	13	1	-	-	97
S. Dak.	-	11	4	33	24	16	-	7	112
Nebr.	28	14	4	14	25	3	-	1	16
Kans.	6	20	8	49	47	7	-	26	35
S. ATLANTIC	12,870	10,985	19	4,065	4,100	5	42	197	1,337
Del.	94	65	1	38	38	2	-	1	57
Md.	651	566	3	386	357	-	3	22	283
D.C.	621	359	-	175	144	-	2	-	13
Va.	399	297	-	372	397	2	12	17	338
W. Va.	37	13	-	66	93	-	1	2	92
N.C.	748	657	9	466	503	-	2	107	8
S.C.	671	668	3	438	420	-	-	22	115
Ga.	2,306	1,527	-	656	721	1	7	23	275
Fla.	7,343	6,833	3	1,468	1,427	-	15	3	146
E.S. CENTRAL	1,828	1,748	24	1,548	1,740	11	3	89	276
Ky.	59	23	10	337	399	5	1	29	111
Tenn.	796	699	10	476	526	5	-	38	60
Ala.	524	456	3	467	503	-	1	10	88
Miss.	449	570	1	268	312	1	1	12	8
W.S. CENTRAL	3,988	4,003	29	2,403	2,286	53	8	137	493
Ark.	225	233	2	278	269	34	-	30	83
La.	785	748	-	306	285	-	4	2	10
Okla.	137	184	9	218	216	16	-	89	31
Tex.	2,841	2,860	18	1,601	1,496	3	4	16	369
MOUNTAIN	782	646	35	510	581	11	11	11	346
Mont.	3	9	-	31	15	-	1	6	192
Idaho	3	5	5	19	29	-	-	1	11
Wyo.	1	3	-	5	2	2	-	3	38
Colo.	99	112	3	57	142	5	3	1	28
N. Mex.	47	54	2	88	85	2	1	-	11
Ariz.	153	274	16	225	252	1	6	-	41
Utah	15	23	9	29	25	1	-	-	9
Nev.	461	166	-	56	31	-	-	-	16
PACIFIC	5,780	7,203	48	3,485	3,811	8	151	4	393
Wash.	196	148	8	204	221	1	13	1	-
Oreg.	279	276	1	135	117	1	7	1	-
Calif.	5,263	6,761	38	2,959	3,238	4	126	2	376
Alaska	14	4	-	41	56	2	-	-	17
Hawaii	28	14	1	146	179	-	5	-	-
Guam	3	2	-	21	26	-	-	-	-
P.R.	605	832	-	216	270	-	5	-	64
V.I.	2	9	-	6	2	-	-	-	-
Amer. Samoa	-	-	-	3	9	-	1	-	-
C.N.M.I.	1	-	-	17	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending November 26, 1988 (47th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	>65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	558	383	104	41	14	16	40
Boston, Mass.	160	101	29	14	10	7	19
Bridgeport, Conn.	33	23	7	2	-	1	2
Cambridge, Mass.	15	12	3	-	-	-	3
Fall River, Mass.	21	17	3	1	-	-	1
Hartford, Conn.§	59	36	12	7	2	2	2
Lowell, Mass.	26	16	7	3	-	-	1
Lynn, Mass.	23	19	3	1	-	-	-
New Bedford, Mass.	25	23	2	-	-	-	1
New Haven, Conn.	24	13	6	3	2	-	7
Providence, R.I.	27	20	4	3	-	-	-
Somerville, Mass.	8	6	2	-	-	-	-
Springfield, Mass.	39	20	12	4	-	3	1
Waterbury, Conn.	29	25	4	-	-	-	1
Worcester, Mass.	69	52	11	3	-	3	2
MID. ATLANTIC	2,503	1,667	472	232	64	67	121
Albany, N.Y.	42	31	8	2	1	-	3
Allentown, Pa.	17	14	1	1	1	-	1
Buffalo, N.Y.	100	73	18	6	2	1	9
Camden, N.J.	43	26	6	4	3	4	2
Elizabeth, N.J.	8	3	4	1	-	-	1
Erie, Pa.†	29	28	-	1	-	-	1
Jersey City, N.J.§	57	39	10	6	1	1	1
N.Y. City, N.Y.	1,461	926	279	161	45	40	61
Newark, N.J.	41	15	7	10	-	8	6
Paterson, N.J.	23	13	6	3	1	-	2
Philadelphia, Pa.	297	203	64	17	4	9	11
Pittsburgh, Pa.†	67	49	14	4	-	-	2
Reading, Pa.	28	21	5	1	1	-	3
Rochester, N.Y.	88	66	16	5	-	1	8
Schenectady, N.Y.	42	35	6	1	-	-	1
Scranton, Pa.†	21	17	3	1	-	-	2
Syracuse, N.Y.	85	59	15	5	3	3	5
Trenton, N.J.	13	10	2	1	-	-	1
Utica, N.Y.§	23	19	2	1	1	-	-
Yonkers, N.Y.	28	20	6	1	1	-	1
E.N. CENTRAL	1,893	1,289	370	131	33	70	80
Akron, Ohio	39	23	6	3	2	5	1
Canton, Ohio	20	15	4	1	-	-	3
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	143	103	20	9	6	5	18
Cleveland, Ohio	118	80	26	7	1	4	7
Columbus, Ohio	123	77	28	11	3	4	1
Dayton, Ohio	7	54	11	7	1	4	1
Detroit, Mich.	144	98	24	14	1	7	2
Evansville, Ind.	35	28	2	3	-	2	-
Fort Wayne, Ind.	43	28	10	3	1	1	3
Gary, Ind.	17	11	3	1	2	-	-
Grand Rapids, Mich.	44	30	7	2	2	3	7
Indianapolis, Ind.	151	102	28	13	-	8	1
Madison, Wis.	36	30	5	-	1	-	3
Milwaukee, Wis.	84	67	13	4	-	-	3
Peoria, Ill.§	53	42	8	2	-	1	4
Rockford, Ill.	36	22	10	1	1	2	2
South Bend, Ind.	33	16	13	2	1	1	-
Toledo, Ohio	73	53	18	1	1	-	7
Youngstown, Ohio	60	48	9	2	-	1	1
W.N. CENTRAL	658	473	115	36	19	15	39
Des Moines, Iowa	36	29	5	1	1	-	1
Duluth, Minn.	20	14	5	1	-	-	-
Kansas City, Kans.	24	17	3	2	2	-	1
Kansas City, Mo.	116	74	25	6	4	7	9
Lincoln, Nebr.	36	24	11	1	-	-	3
Minneapolis, Minn.	142	103	26	10	1	2	13
Omaha, Nebr.	44	29	10	3	-	2	6
St. Louis, Mo.	122	98	9	6	8	1	-
St. Paul, Minn.	62	49	9	2	-	2	3
Wichita, Kans.	56	36	12	4	3	1	3
S. ATLANTIC	1,105	654	250	110	32	59	46
Atlanta, Ga.	120	59	33	13	4	11	2
Baltimore, Md.	295	186	57	30	8	15	10
Charlotte, N.C.	64	43	15	5	-	1	9
Jacksonville, Fla.	76	40	20	7	7	2	2
Miami, Fla.	82	42	21	15	2	2	1
Norfolk, Va.	53	29	14	2	2	6	3
Richmond, Va.	63	37	17	7	1	1	9
Savannah, Ga.	59	41	12	5	1	-	4
St. Petersburg, Fla.	63	54	6	2	-	1	1
Tampa, Fla.	60	36	15	6	1	2	4
Washington, D.C.	152	75	35	18	6	18	1
Wilmington, Del.	18	13	5	-	-	-	-
E.S. CENTRAL	561	358	109	50	13	30	33
Birmingham, Ala.	93	55	21	6	1	10	1
Chattanooga, Tenn.	59	45	10	-	1	3	2
Knoxville, Tenn.§	80	55	16	5	4	-	7
Louisville, Ky.	45	33	5	5	-	2	3
Memphis, Tenn.	138	78	30	16	4	10	17
Mobile, Ala.	38	32	3	2	1	-	-
Montgomery, Ala.	21	16	3	1	-	1	-
Nashville, Tenn.	67	44	21	15	2	4	3
W.S. CENTRAL	1,494	920	331	151	52	38	50
Austin, Tex.	45	35	3	5	1	1	6
Baton Rouge, La.	31	20	8	-	-	3	1
Corpus Christi, Tex.§	48	37	10	1	-	-	1
Dallas, Tex.	154	91	33	18	7	5	6
El Paso, Tex.	25	10	11	-	3	1	1
Fort Worth, Tex	92	68	13	5	3	3	3
Houston, Tex.§	734	436	169	89	24	16	18
Little Rock, Ark.	33	17	12	2	2	-	1
New Orleans, La.	112	64	29	13	4	2	-
San Antonio, Tex.	111	66	20	14	5	4	4
Shreveport, La.	27	18	6	2	-	1	2
Tulsa, Okla.	82	58	17	2	3	2	7
MOUNTAIN	556	350	122	49	15	20	21
Albuquerque, N. Mex.	53	26	12	11	4	-	1
Colo. Springs, Colo.	19	12	5	1	1	-	2
Denver, Colo.	82	47	16	7	3	9	3
Las Vegas, Nev.	82	54	20	6	2	-	6
Ogden, Utah	19	14	3	1	-	1	-
Phoenix, Ariz.	152	93	37	12	3	7	3
Pueblo, Colo.	19	17	2	-	-	-	1
Salt Lake City, Utah	42	27	10	3	-	2	-
Tucson, Ariz.	88	60	17	8	2	1	5
PACIFIC	1,472	974	259	148	50	38	77
Berkeley, Calif.	10	8	-	2	-	-	-
Fresno, Calif.	34	24	4	1	-	5	2
Glendale, Calif.§	15	13	2	-	-	-	-
Honolulu, Hawaii	62	43	12	4	3	-	7
Long Beach, Calif.	58	36	14	7	-	1	3
Los Angeles Calif.§	420	282	65	47	19	4	17
Oakland, Calif.	45	28	7	6	3	2	1
Pasadena, Calif.	26	19	6	1	-	-	1
Portland, Oreg.	131	92	21	8	5	5	8
Sacramento, Calif.	78	54	13	6	3	2	8
San Diego, Calif.	143	88	23	14	8	10	6
San Francisco, Calif.	110	66	23	15	2	4	3
San Jose, Calif.	153	98	27	23	4	1	10
Seattle, Wash.	102	56	27	13	3	3	-
Spokane, Wash.	89	50	7	1	-	1	10
Tacoma, Wash.	26	17	8	1	-	-	1
TOTAL	10,800††	7,068	2,132	948	292	353	507

*Mortality data in this table are voluntarily reported from 121 cities in the United states, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

**Pneumonia and influenza.

†Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

††Total includes unknown ages.

§Data not available. Figures are estimates based on average of past available 4 weeks.

Influenza – Continued

Two other isolates of influenza B reported from Houston were recovered from specimens obtained from two children, aged 5 and 10 years, on November 1 and 2, respectively; these children were patients of a pediatrician serving as a sentinel physician for the Baylor College of Medicine Influenza Research Center. In addition, three isolates of influenza type B have been recovered from specimens obtained from children 9, 11, and 12 years of age in Austin, Texas, since late October. Influenza B virus has also been isolated from a 4-year-old child in Arizona and a 1-year-old child in Michigan.

Influenza type A virus has been reported from Maryland and Hawaii. The first case occurred in a 27-year-old male student in Bethesda, Maryland. He had onset of severe headache, sore throat, myalgias, arthralgias, and fever of 103 F (39.4 C) on November 9. A throat swab obtained on November 10 by a physician participating in the Sentinel Physician Surveillance Network yielded influenza type A virus, identified by rapid culture confirmation on November 14. The health center at the student's university has since noted an increase in cases of influenza-like illness, but specimens obtained from other ill persons at the university have not yielded influenza viruses. One other case of influenza type A has been reported; this case occurred in a 33-year-old woman in Hawaii during early November.

Further antigenic analysis of the isolates obtained from the sporadically occurring cases and the cases in the outbreak of influenza B continues. Also, subtyping of the influenza A viruses is pending.

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Reference

1. CDC. Influenza—United States, 1987–88 season. MMWR 1988;37:497–503.

Periconceptional Use of Multivitamins and the Occurrence of Anencephaly and Spina Bifida

In 1988, CDC completed the analysis of data collected in 1982 and 1983 from a population-based case-control study to evaluate the association between periconceptional multivitamin use* and the occurrence of anencephaly or spina bifida (neural tube defects [NTDs]). Results of this study suggest that mothers who were periconceptional multivitamin users were at lower risk of having babies with NTDs than were mothers who did not use multivitamins (*1*).

In 1982 and 1983, the Atlanta Birth Defects Case-Control (ABDCC) Study obtained information from parents of babies with serious malformations identified through the Metropolitan Atlanta Congenital Defects Program. Information was gathered also from a randomly selected group of parents of babies without birth defects from the

*Periconceptional multivitamin use was defined as regular multivitamin or prenatal vitamin use during every month of a 6-month periconceptional period (i.e., 3 months before conception through the first 3 months of pregnancy).

Multivitamins — Continued

same area identified through birth certificates. Mothers were questioned about a variety of maternal exposures, including multivitamin use, through a telephone interview (*2,3*).

A total of 519 babies with NTDs and 4043 controls without birth defects were identified. The mothers of 347 NTD babies and 2829 matched controls completed interviews, for an overall 70% participation rate. Participation was higher for white mothers (74%) than for mothers of other races (57%). To assess possible maternal recall bias, a second control group, comprising ABDCC mothers whose babies had serious birth defects other than NTDs (n=3665), was used.

In addition to the group of mothers defined as periconceptional multivitamin users, mothers who used multivitamins were classified into two additional groups: 1) early postconceptional multivitamin users (use during each of the first 3 months of pregnancy only) and 2) late postconceptional multivitamin users (use during the second and/or third months of pregnancy only). Mothers who said they used vitamins <3 times a week and mothers who reported no periconceptional vitamin use were considered nonusers of multivitamins. Fourteen percent of mothers reported periconceptional multivitamin use, 11% reported early postconceptional multivitamin use, 28% reported late postconceptional multivitamin use, 40% reported nonuse, 5% reported other vitamin use, and 2% were unknown.

For mothers who were periconceptional multivitamin users, the risk of having babies with NTDs was lower than that for mothers who did not use multivitamins (odds ratio = 0.41, 95% CI = 0.26, 0.66) (Table 1). For mothers who were early or late postconceptional multivitamin users, the odds ratios were 0.75 and 0.86, respectively (Table 1). For anencephaly and spina bifida separately, odds ratios were <1.0, except for mothers of other races whose babies had anencephaly. These odds ratios for early and late postconceptional multivitamin use relative to no multivitamin use were 1.80 and 1.28, respectively. Neither of these associations was statistically significant.

TABLE 1. Odds ratios for specified multivitamin use groups and neural tube defects, by race — Atlanta, 1968–1980

	Periconceptional use vs. no use		Early post-conceptional use vs. no use		Late post-conceptional use vs. no use	
Defect/Race	Odds ratio	95% Confidence limits	Odds ratio	95% Confidence limits	Odds ratio	95% Confidence limits
All NTDs						
White	0.40	0.25, 0.63	0.66	0.43, 1.01	0.84	0.63, 1.13
Other	0.39	0.08, 1.82	1.28	0.53, 3.05	1.03	0.49, 2.17
Total	0.41	0.26, 0.66	0.75	0.50, 1.11	0.86	0.66, 1.14
Anencephaly						
White	0.48	0.25, 0.95	0.65	0.33, 1.27	0.78	0.50, 1.22
Other	0.45	0.05, 3.85	1.80	0.52, 6.26	1.28	0.41, 3.99
Total	0.48	0.25, 0.91	0.79	0.44, 1.41	0.83	0.55, 1.26
Spina bifida						
White	0.34	0.18, 0.67	0.70	0.39, 1.26	0.88	0.61, 1.27
Other	0.32	0.04, 2.50	0.97	0.27, 3.53	0.91	0.34, 2.38
Total	0.34	0.18, 0.64	0.74	0.43, 1.26	0.88	0.63, 1.25

Multivitamins – Continued

When periconceptional multivitamin use among mothers of babies with NTDs was compared with use among mothers of babies with all other types of major malformations, odds ratios were similar to those obtained using controls without birth defects.

Reported by: Birth Defects and Genetic Diseases Br, Div of Birth Defects and Developmental Disabilities, Center for Environmental Health and Injury Control, CDC.

Editorial Note: Severe congenital malformations occur in 2%–4% of all infants born in the United States. The cause of most of these defects is unknown. NTDs are among the more common severe congenital malformations. Approximately 3500 infants with anencephaly or spina bifida (1 case per 1000 live births) are born each year in the United States. The etiologies of NTDs are usually unknown.

Women who previously have had NTD-affected infants are at increased risk of having similarly affected infants in subsequent pregnancies. Periconceptional multivitamin use by these women had been reported to reduce this risk (*4*), but no studies similar to that reported here had been done among women who have not previously had an NTD-affected infant.

The CDC study is the first population-based investigation of the relationship between multivitamin use and birth defects in the United States. The findings suggest that women who have never had an NTD-affected child and who use periconceptional multivitamins are less likely to have an infant with an NTD.

Methodologic concerns about case-control studies, such as the representativeness of a sample, call into question the strength of the conclusions about a multivitamin effect. In this study, periconceptional multivitamin users differed from nonusers in a number of demographic, health-related, and lifestyle characteristics. These include maternal age, education, alcohol use, and history of stillbirths or fetal deaths before the index birth, use of spermicides before the index birth, smoking any time during the periconceptional period, and a maternal history of chronic illness. Adjusting the data for these factors did not change results. However, it is not known whether the apparent protective effect of multivitamins for NTDs results directly from multivitamin use or from other characteristics of women who use multivitamins.

Randomized clinical trials offer an opportunity to minimize the inherent weaknesses, such as selection and recall bias, of case-control studies. Such clinical trials among mothers of NTD-affected children in the United Kingdom and Egypt are being conducted to assess the effect of multivitamin use on the recurrence of NTDs.

Recent laboratory data have increased interest in the mechanisms of folate metabolism and its possible relationship to NTDs. Studies have been done measuring red cell folate in women who had a history of two or more NTD pregnancies. Compared to a control group, mothers with an NTD-affected pregnancy had lower red cell folate levels. These studies suggest that maternal metabolic factors are involved in the etiology of NTDs (*5,6*), indicating that the mechanisms relating to these factors should be explored further.

Evidence is insufficient to recommend periconceptional multivitamin use in the United States to prevent NTDs. The question of whether multivitamin use affects the risk of NTDs can be answered best by randomized clinical trials of proper design and size and through clinical and biochemical studies.

References

1. Mulinare J, Cordero JF, Erickson JD, Berry RJ. Periconceptional use of multivitamins and the occurrence of neural tube defects. JAMA 1988;260:3141–5.

Multivitamins — Continued

2. Erickson JD, Mulinare J, McClain PW, et al. Vietnam veterans' risks for fathering babies with birth defects. JAMA 1984;252:903–12.
3. CDC. Vietnam veterans' risks for fathering babies with birth defects. Atlanta: US Department of Health and Human Services, Public Health Service, 1984.
4. Smithells RW, Nevin NC, Seller MJ, et al. Further experience of vitamin supplementation for prevention of neural tube defect recurrences. Lancet 1983;1:1027–31.
5. Yates JR, Ferguson-Smith MA, Shenkin A, Guzman-Rodriguez R, White M, Clark BJ. Is disordered folate metabolism the basis for the genetic predisposition to neural tube defects? Clin Genet 1987;31:279–87.
6. Trotz M, Wegner C, Nau H. Valproic acid-induced neural tube defects: reduction by folinic acid in the mouse. Life Sci 1987;41:103–10.

FIGURE I. Reported measles cases — United States, Weeks 43–46, 1988

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